Apr 6th, 6:30 PM - 8:00 PM

An Examination of the Four Different Controls of the Ames Test

Hans Lo
Illinois Wesleyan University

AN EXAMINATION OF THE FOUR DIFFERENT CONTROLS OF THE AMES TEST

Hans Lo, Dept. of Biology, Illinois State University*

The Ames Test is one of the most widely used and inexpensive methods to test whether certain chemicals are mutagenic. In an Ames test experiment, normally 1-2x10^8 of a his^- mutant strain of Salmonella typhimuriam is grown in a low histidine agar culture. Various concentrations of the anti-mutagen and/or the mutagen are placed in the culture. The number of colonies are counted after two days of incubation. The presence of each colony indicates that a reversion mutation has taken place in the bacterial histidine operon.

The purpose of our project is to examine and critique four different control procedures for the Ames Test. Through these investigations, we also hope to find out what the maximum concentration of the antimutagen can be without significantly interferring with the spontaneous mutation rate. In all the four controls, S. typhimurium strain TA98 is used, no mutagen is present, and various concentrations of the anti-mutagen retinol is placed in the culture medium. The procedure for the spontaneous mutation test, is exactly the same as a regular test except that the mutagen is absent. The result of this test supposedly indicates the number of spontaneous revertants. The second control is the retinol toxicity test in which 500-1,000 TA98 are grown in a high histidine medium. The result of this test will help draw a line beyond which higher concentrations of retinol will exert significant toxic effect on the bacteria. The procedure for the reconstruction test is the same as the spontaneous test except that 500-1,000 revertant TA98 are also added to the culture. The addition of revertant TA98 ensures that the decrease in the number of colonies with the increase of antimutagen concentration is mostly due to the presence of retinol. The last control is the filler cell test, in which 500-1,000 TA98 cells are mixed with 1-2x10^8 of strain SV50 and all bacteria are grown in a high histidine medium. Due to the higher number of bacteria in this test, the result shows a more accurate toxicity effect of the retinol than the toxicity test.